

*The Penguin Dictionary of*  
**ELECTRONICS**

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exposed surface level (Fig. a). Oxidation may be preceded by etching of the exposed silicon surface so that the final oxide surface is at the same level as the original substrate (Fig. b). The silicon nitride is then removed from the rest of the surface and the integrated circuits are formed using normal  $\rightarrow$  planar-process technology.

**coplanar waveguide (CPW)** A  $\rightarrow$  transmission line medium comprising three conductors on the surface of a dielectric substrate: two ground planes and a central signal line, separated by gaps. The characteristic impedance is determined by the ratio of the gap width to the thickness of the dielectric substrate, and the dielectric constant of the substrate.

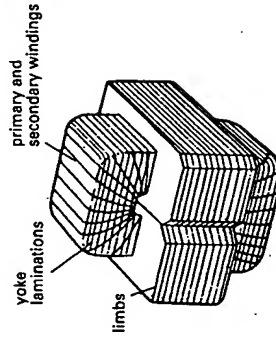
**copper loss** *Syn.* for  $I^2R$  loss.  $\rightarrow$  heating effect of a current; dissipation.

**coprocessor** A support chip manufactured to operate in parallel with the processor of a computer, usually a  $\rightarrow$  microprocessor, and add functionality to it. Typical coprocessor functions include high-speed arithmetic, mapping hardware for virtual memory, and high-speed graphics.

**core 1.** The ferromagnetic portion of the magnetic circuit of an electromagnetic device. A simple *ferrite core* is a solid piece of ferromagnetic material suitably shaped into a cylinder, toroid, etc. A *laminated core* is composed of laminations of ferromagnetic material insulated from each other;  $\rightarrow$  eddy currents are thus reduced. A *wound core* is one constructed from strips of ferromagnetic material wound spirally in layers. **2.** *Syn.* core store. An obsolete type of nonvolatile computer  $\rightarrow$  memory that consisted of an array of rings of  $\rightarrow$  ferrite material strung on a grid of wires. The individual rings — *ferrite cores* — were of the order of a millimetre in diameter. Information was stored in the array by causing the direction of magnetization of a core to be either clockwise or anticlockwise, corresponding to the binary digits one or zero. There was  $\rightarrow$  random access to the memory locations. Information was input and output by electronic means using the wire grid to read or write.

**core loss** *Syn.* iron loss. The total energy dissipation in the ferromagnetic  $\rightarrow$  core of an inductor or transformer. The energy loss is mainly due to  $\rightarrow$  eddy currents and hysteresis loss ( $\rightarrow$  magnetic hysteresis) in the core.

**core-type transformer** A transformer in which most of the  $\rightarrow$  core is enclosed by the



Single-phase core-type transformer

windings. The core is made from laminations; usually the yoke is built up from a stack of laminations and the windings are formed around this (see diagram). Once the windings have been formed extra laminations are added to form limbs around each winding and thus complete the core.  $\rightarrow$  shell-type transformer.

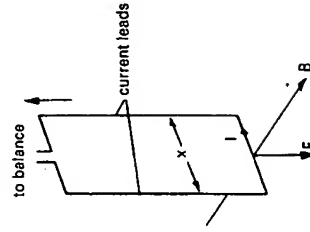
**corner frequency** *Syn.* for cut-off frequency.

**corner reflector antenna** A special form of reflector ( $\rightarrow$  directional antenna) in which two reflecting plates are joined so as to form a corner. The feed element, usually a  $\rightarrow$  dipole, is placed within the region of the corner depending on the application. The included angle is often  $90^\circ$ , in which case the corner reflector will return the received signal in exactly the same direction as it received it; this makes it useful as, for example, a passive target in radio or communication applications.

**correlation** The process of comparison of signals to establish how alike they are, or the extent of correspondence so found. When two signals are compared with each other, the process is known as *cross correlation*, and if a signal is compared with itself it is referred to as *autocorrelation*. The *correlation function* is the result of multiplying the signals together for different values of time delay between them. A peak in the correlation function indicates a delay at which the signals have a degree of periodicity, and the delay associated with such a peak gives the time period.

**correlation function**  $\rightarrow$  correlation.

**cosine potentiometer**  $\rightarrow$  potentiometer.



Cotton balance

**Cotton balance** *Syn.* electromagnetic balance. An absolute means of measuring  $\rightarrow$  magnetic flux density, *B*, in air; it is capable of extremely high accuracy. This method can only be used for fairly strong fields that are uniform over a reasonable volume.

A long rectangular coil is suspended from an analytical balance with the lower end of the coil suspended in the magnetic flux that is to be measured (see diagram). The field is directed horizontally with the lower edge of the coil directed perpendicularly to the lines of *B*. The long sides of the coil experience no vertical force due to *B*, since they are vertical, and act as leads for the lower edge. Provided that these leads are suf-